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5.11 Soils

This section describes the potential effects of the construction and operation of the Stanton Energy Reliability Center (SERC) on soil resources and is organized as follows: Section 5.11.1 describes the existing environment, including soil types and their use; Section 5.11.2 presents the environmental analysis for the SERC; Section 5.11.3 discusses cumulative effects; Section 5.11.4 presents mitigation measures; Section 5.11.5 presents the laws, ordinances, regulations, and standards (LORS) applicable to soils and their use; Section 5.11.6 provides agency contacts for all involved agencies; Section 5.11.7 describes permits required for the SERC; and Section 5.11.8 provides the references that were used to develop this section.

5.11.1 Affected Environment

The Stanton Energy Reliability Center (SERC) site is located within the City of Stanton in Orange County, California. There are commercial, mixed industrial, and residential land uses in the project vicinity. Dale Avenue is located to the east of the site, Union Pacific Railroad tracks are located to the south, the intersection of Pacific Street and Fern Avenue is located to the west, and commercial and light-industrial facilities or undeveloped land are located to the north.

The SERC will connect with the existing Southern California Edison (SCE) Barre Substation via a new offsite 0.35-mile-long underground 66-kilovolt transmission line that runs generally east from the SERC site beyond Dale Avenue to a location in the Barre Substation northeast of the SERC site. The interconnecting gen-tie line will include a single new steel monopole structure, with disconnect switch, to be located on the western side of Dale Avenue. At the location of the pole structure, the gen-tie line surfaces and resubmerges in order to allow a circuit disconnect switch to be installed. Other than this pole structure and the SERC switchyard and SCE's Barre Substation, the remainder of the gen-tie line will be constructed underground. Process and potable water will be supplied from Golden State Water Company via a connection adjacent to the project site within the existing Dale Avenue roadway corridor. Industrial wastewater will be discharged to the City of Stanton's sanitary sewer line adjacent to the project site. The SERC site laydown area will be on the western portion of the SERC site, of which approximately 60 percent of the area is currently paved. Temporary construction facilities will include a 2.89-acre paved worker parking area at the Bethel Romanian Pentecostal Church, 350 feet south of the SERC site at the southeastern corner of Dale Avenue and Monroe Avenue.

Two alternatives are proposed for routing of the new offsite 12- or 16-inch-diameter natural gas pipeline. The northern route alternative will begin on the eastern edge of Parcel 1 adjoining Dale Avenue and will continue 2.75 miles north, terminating at Southern California Gas Company's existing line at La Palma Avenue. The southern route alternative will begin at the same point of connection as the northern route, and will travel 1.78 miles south along Dale Avenue to Southern California Gas Company's existing line in Lampson Avenue.

The SERC site is occupied by and composed of an existing trucking company, a wooden pallet storage company, and undeveloped land. The surrounding areas are largely built out; therefore, new large-scale development near the project area is unlikely to occur. Land uses adjacent to the SERC site include light industrial, storage, residential, Union Pacific Railroad right-of-way, and SCE's Barre Substation.

Records show that a former underground storage tank (UST) was removed from the western portion of the site (Parcel 2), and it is considered to be a historical recognized environmental condition in connection with the site (Advantage Environmental Consultants, LLC [AEC], 2016a). The Phase I Environmental Site Assessment (ESA) noted areas of stained soil and pavement with containers of used oil and other chemical products also present, and recommended the completion of a Phase II ESA. A Phase II ESA was performed in August 2016 (AEC, 2016b), and it concluded via observations, soil sample chemical analyses, and soil gas sampling that no hazards or contaminants exist onsite that will warrant additional environmental remediation.

A description of the soils in the SERC area was developed using the online soil survey information for Orange County and Part of Riverside County, California (CA678) (Soil Survey Staff, 2016a). Descriptions of the soil map units were developed from the soil survey information and the Natural Resources Conservation Service (NRCS) Official Soil Series Descriptions (Soil Survey Staff, 2016b).

Soil map units for the SERC area are identified in Figure 5.11-1, which also includes soil map unit characteristics for the area that will be potentially affected by project construction. The SERC area includes the SERC site, laydown area, corridors for the natural gas pipeline, and the gen-tie line. Table 5.11-1 summarizes depth, texture, drainage, permeability, water runoff, and items related to revegetation potential. Actual soil conditions in much of the SERC area could differ from what is described in the generalized soil descriptions because urban development has occurred within most of the general SERC area (with the exception of the SERC site).

Table 5.11-1. NRCS Soil Map Unit Descriptions and Characteristics*

Map Unit	Description	
146	**Corralitos loamy sand**	
	A portion of the natural gas pipeline route (northern alternative) crosses this soil map unit.	
	Landform:	Alluvial fans
	Parent material:	Alluvium derived from mixed sources
	Typical profile:	Loamy sand over stratified sand to loamy sand
	Shrink-swell potential:	Low
	Depth and drainage:	Very deep, somewhat excessively drained
	Permeability:	Rapid
	Runoff class:	Negligible
	Capability class:	3s (irrigated), 3e (non-irrigated)
	Taxonomic class:	Mixed, thermic Typic Xeropsamments
158	**Hueneme fine sandy loam, drained:**	
	The entire project site and portions of the natural gas pipeline route cross this soil map unit.	
	Landform:	Alluvial fans
	Parent material:	Stratified alluvium derived from sedimentary rock
	Typical profile:	Fine sandy loam over stratified sand to silt loam
	Shrink-swell potential:	Low
	Depth and drainage:	Very deep, poorly drained, unless drained artificially. (At the SERC site Hueneme soils are drained)
	Permeability:	Moderately rapid
	Runoff class:	Low or very low
	Capability class:	1 (irrigated), 3c (non-irrigated)
	Taxonomic class:	Coarse-loamy, mixed, superactive, calcareous, thermic Oxyaquic Xerofluvents
163	**Metz loamy sand**	
164	**Metz loamy sand, moderately fine substratum**	
	Portions of the natural gas pipeline route cross these soil map units. 164 is included in the northern alternative.	
	Landform:	Alluvial fans
	Parent material:	Alluvium derived from mixed
	Typical profile:	Loamy sand over stratified sand to fine sandy loam [163] Loamy sand over stratified sand to sandy clay loam and silt loam, silty clay loam, and stratified sandy clay loam [164]
	Shrink-swell potential:	Low
	Depth and drainage:	Very deep, somewhat excessively drained
	Permeability:	Moderately rapid
	Runoff class:	Low [163], assumed similar for [164]
	Capability class:	2s (irrigated), 4e (non-irrigated)
	Taxonomic class:	Sandy, mixed, thermic Typic Xerofluvents

Table 5.11-1. NRCS Soil Map Unit Descriptions and Characteristics*

Map Unit	Description	
194	**San Emigdio fine sandy loam, 0 to 2 percent slopes**	
196	**San Emigdio fine sandy loam, moderately fine substratum, 0 to 2 percent slopes**	
	A portion of the natural gas pipeline route crosses these soil map units. 194 is included in the southern alternative while 196 is included in the northern alternative.	
	Landform:	Alluvial fans
	Parent material:	Alluvium derived from sedimentary rock
	Typical profile:	Fine sandy loam over stratified gravelly loamy coarse sand to very fine sandy loam [194] Fine sandy loam over stratified gravelly loamy coarse sand to very fine sandy loam and silty clay loam and stratified gravelly loamy coarse sand to very fine sandy loam [196]
	Shrink-swell potential:	Low
	Depth and drainage:	Very deep, well drained
	Permeability:	Moderately rapid
	Runoff class:	Very low [196], assumed similar for [194]
	Capability class:	1 (irrigated), 3c (non-irrigated) [194] 2s (irrigated), 3s (non-irrigated) [196]
	Taxonomic class:	Coarse-loamy, mixed, superactive, calcareous, thermic Typic Xerofluvents

* Phases of the same soil unit (those with the same soil series name, surface texture, landform, and typical profile) are grouped together in this table for brevity.

Note:

Soil characteristics are based on soil descriptions available on the NRCS's Web Soil Survey (Soil Survey Staff, 2016a) and NRCS Official Soil Series Descriptions (Soil Survey Staff, 2016b). Soil descriptions provided above are limited to those soil units that could be directly affected by the SERC. Other soil map units, which are well outside of the project area but are shown on Figure 5.11-1, include 123 – Bolsa silt loam, drained; 166 – Mocho loam, 0 to 2 percent slopes, warm MAAT, MLRA 19.

5.11.1.1 Agricultural Use

The SERC area is urban, and land uses include light industrial, storage, and residential. According to the Orange County Important Farmland Map 2014 (California Department of Conservation, 2014), the City of Stanton is mapped by the Farmland Mapping and Monitoring Program and is designated as urban and built-up land. Based on a review of recent aerial photography, there is no agricultural production within 1 mile of the SERC site. However, an L-shaped section of land within the SCE right-of-way adjacent to the east of the Barre Substation is designated as Unique Farmland. This area is within a major transmission line right-of-way and is currently used as a nursery to grow landscape plants or as open space/city park. The soils mapped at the project site and surrounding areas have been developed for light industrial, commercial, and residential uses. There is very little undeveloped land remaining near the SERC site, and remaining areas are unsuitable for commercial crop production (see Section 5.6, Land Use, for additional information).

5.11.1.2 Wetlands

There are no wetlands on the SERC site or in the immediate site vicinity. The Stanton Storm Channel passes through the SERC site, drains southwesterly into the Bolsa Chica Channel, and then drains to Huntington Harbor, Anaheim Bay, and the Pacific Ocean, approximately 7.5 miles southwest of the SERC.

5.11.1.3 NRCS Soil Map Units

Table 5.11-1 describes the properties of the NRCS soil map units found in the vicinity of the project site. The major soil map units for each feature are discussed briefly below.

As shown in Figure 5.11-1, the SERC site is associated with one map unit, Hueneme fine sandy loam, drained (158). Hueneme soils are formed in alluvial fans from coastal plains and valleys in southern California. Soil in the upper part of the profile has a loamy fine sand texture.

All linear facilities will be constructed within existing city streets that overlie compacted fill. Mapped soil types, however, vary across the proposed alignments of the gen-tie line and two natural gas pipeline alternatives. The gen-tie line alignment is located in the same soil map unit as the SERC site. There are two potential natural gas pipeline routes: the northern alternative traverses Hueneme soils before traversing Metz, San Emigdio, and Carralitos soils. The southern alternative also traverses Hueneme soils before traversing Metz and San Emigdio soils.

The process and potable water will be supplied by existing water mains via connections in Dale Avenue and Pacific Street; no linear facility construction will be required for water supply.

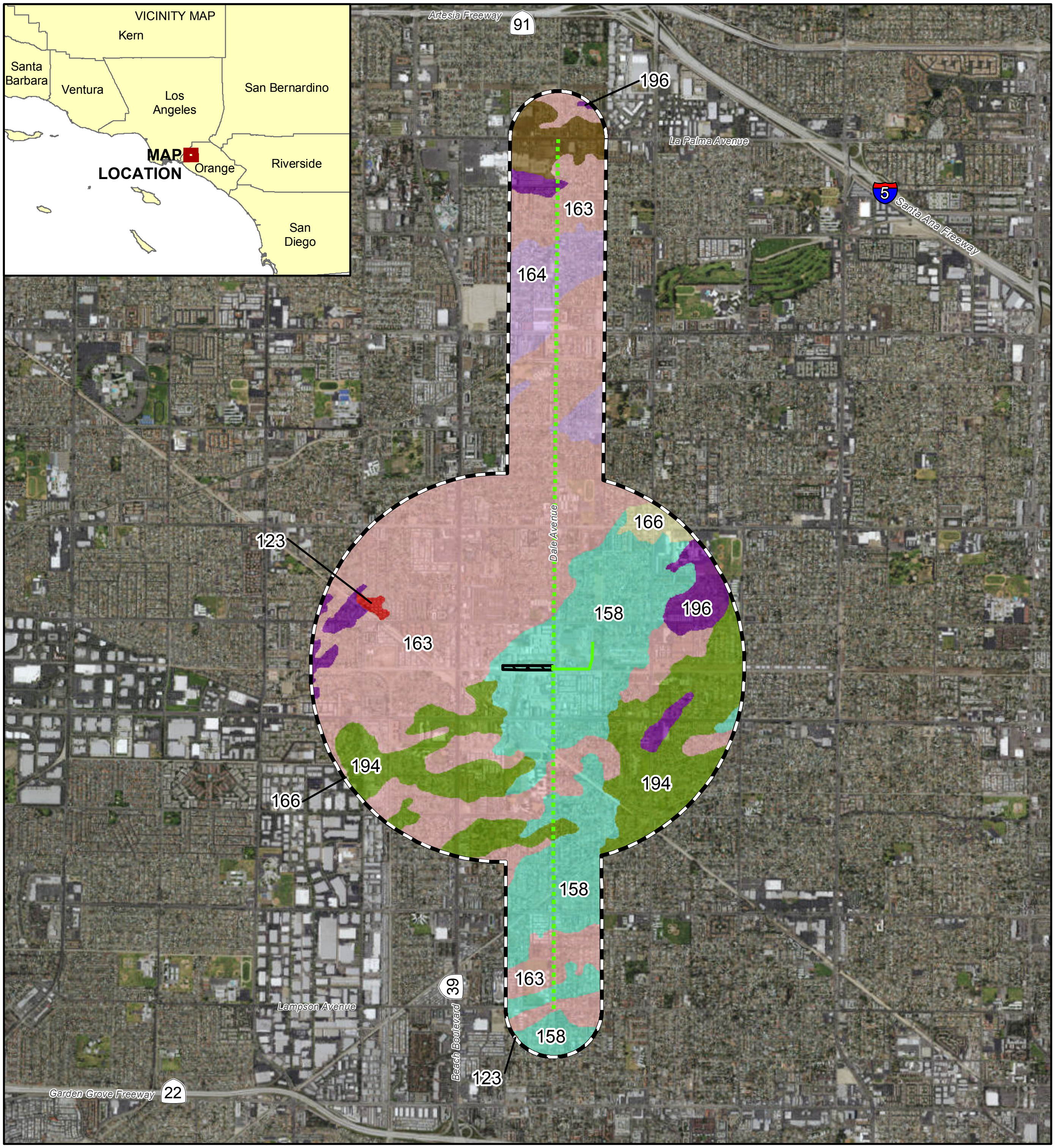
While urban development has occurred on these soils, native soils have likely been excavated and replaced with compacted fill material in upper profile. Nevertheless, available soil survey information is provided about soils within the SERC footprint. Parcel 1 of the SERC site is an undeveloped vacant parcel; and Parcel 2, including some paved areas, and except for one small modular office structure, is generally utilized for outdoor storage. Soil properties of both parcels should be reflected in the profile description.

5.11.1.4 Potential for Soil Loss and Erosion

The factors that have the largest effect on soil loss include steep slopes, lack of vegetation, and erodible soils composed of large proportions of silt and fine sands. The SERC area and corridors for the natural gas and gen-tie lines are relatively flat, with fine to medium-textured soils, so particular measures may have to be undertaken to prevent erosion during construction in those areas.

The SERC site is flat and Parcel 1 is undeveloped land, while Parcel 2 is partially covered in asphalt concrete and partially highly compacted bare ground. Parcel 2 will be used as the construction laydown area while the power block is being built on Parcel 1. Paving on Parcel 2 will likely be removed after construction on Parcel 1 is complete, and will be regraded for installation of battery energy storage, water tanks, and storage, leaving site soils disturbed and exposed. The soils at the SERC site are expected to have relatively low water erosion potential and a low to moderate wind erosion potential for the following reasons:

- There are nearly level conditions at the SERC site and laydown areas, and the native soils units are expected to have moderately rapid to rapid permeability and, consequently, low runoff.
- Loamy sand and sandy loam soil textures are normally susceptible to wind erosion. However, soils underlying pavement on a portion of the site are likely compacted, which would mitigate wind erosion potential on that portion of the site.
- The SERC is in an urban area where there is a low likelihood of significant ground-level winds leading to wind erosion.



Source:Esri World Imagery. United States Department of Agriculture, Natural Resources Conservation Service, Soil Survey Geographic Database (2015)

LEGEND

- Project Site
- Proposed Natural Gas Pipeline Route Alternatives
- Generator Tie-Line
- 1 Mile Project Buffer/ 0.25 Mile Pipeline Buffer

N

0 2,125 4,250 Feet

- 123 - Bolsa silt loam, drained
- 146 - Corralitos loamy sand
- 158 - Hueneme fine sandy loam, drained
- 163 - Metz loamy sand
- 164 - Metz loamy sand, moderately fine substratum
- 166 - Mocho loam, 0 to 2 percent slopes, warm MAAT, MLRA 19
- 194 - San Emigdio fine sandy loam, 0 to 2 percent slopes
- 196 - San Emigdio fine sandy loam, moderately fine substratum, 0 to 2 percent slopes

Figure 5.11-1
NRCS Soil Map Units Within Project Area
Stanton Energy Reliability Center AFC
Stanton, California

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5.11.1.5 Other Significant Soil Characteristics

Other significant soil characteristics at the SERC site include the liquefaction risk, the potential for organic soils, and the potential for contaminated soils, all of which are discussed below.

5.11.1.5.1 Expansive Soils

The soil units underlying the SERC site are classified as having a low shrink-swell potential. Borings advanced at the site did not identify the presence of clay-rich soils (Kling, 2011; NV5, 2016). Expansive soils are not anticipated to be a concern at the site.

5.11.1.5.2 Liquefaction Risk

Soil conditions at the SERC site predominantly consist of alluvial deposits that could include liquefiable materials such as loose, sandy soils. The findings of a 2011 geotechnical investigation report concluded that some of the soil layers underlying the site are susceptible to liquefaction (Kling Consulting Group [Kling], 2011). In addition, a 2016 geotechnical investigation also identified subsurface material consisting of poorly to moderately consolidated alluvial silt and with varying contents of clay. The findings of the 2016 study concluded that some of the soil layers underlying the site are susceptible to liquefaction (NV5, 2016). According to the State of California seismic hazards zones map, the SERC site is located in a Zone of Required Investigation for liquefaction (California Department of Conservation, 1998). Further analysis of liquefaction potential is presented in Section 5.4, Geological Hazards and Resources.

5.11.1.5.3 Potential for Shallow Groundwater

The SERC site is located in an area of Hueneme fine sandy loam (158), which is a poorly drained soil. The geotechnical investigation reported groundwater at approximately 20 feet below ground surface (NV5, 2016). The Hueneme fine sandy loam (158) has been drained and is not expected to have shallow groundwater conditions based on the geotechnical report.

5.11.1.5.4 Potential for Organic Soils

According to the NRCS Official Soil Series Descriptions, Hueneme soils may contain organic matter in the surface horizon, but the amount of organic matter decreases with depth. Because of the urbanized nature of the area and because the site has been disconnected from the historic flood plain, potential for substantial organic matter in soils on the SERC site is considered low. Further analysis of organic matter content will be evaluated in a SERC site-specific geotechnical investigation.

5.11.1.5.5 Potential for Soil Contamination

A Phase I ESA was completed by AEC in August 2016. The ESA identified that a former UST was removed from the western portion of the SERC site and is considered to be a historical recognized environmental condition in connection with the site (AEC, 2016a). AEC observed numerous containers of used oil and other chemical products, as well as stained soil and pavement in the areas of these containers during site reconnaissance. These releases are not considered to be recognized environmental conditions because they are likely superficial in nature, although a Phase II ESA was recommended. The Phase II ESA was completed by AEC and confirmed that there were no recognized environmental conditions on the site (AEC, 2016b).

The State Water Resources Control Board (SWRCB) GeoTracker database was searched for evidence of known contamination along the linear portions of the SERC project. There are several permitted USTs along Dale Avenue, along both the northern and southern pipeline route alternatives (SWRCB, 2016). Five Leaking Underground Storage Tank Cleanup Sites were found along the northern pipeline route alternative, and eight Leaking Underground Storage Tank Cleanup Sites were found along the southern Pipeline Alternative. In each case, the cleanup site status is completed and the cases are closed (SWRCB, 2016). No other cleanup sites or issues were observed on the GeoTracker database for any of the SERC site linears.

5.11.2 Environmental Analysis

The following sections describe the potential environmental effects on soils during the construction and operation phases of the SERC.

5.11.2.1 Significance Criteria

The potential for impacts to soil resources and their uses (such as agriculture) were evaluated with respect to the criteria described in Appendix G of the California Environmental Quality Act (CEQA) Guidelines (Sections 15000–15387, Title 14, California Code of Regulations, Chapter 3). An impact is considered potentially significant if it would do the following:

- Involve other changes in the existing environment which, because of their location or nature, could result in conversion of farmland to nonagricultural use
- Impact jurisdictional wetlands
- Result in substantial soil erosion or the loss of topsoil
- Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (International Code Council, 1997), creating substantial risks to life or property

The following subsections describe the anticipated environmental impacts on agricultural production and soils during project construction and operation.

5.11.2.2 Farmland Conversion

The SERC site is not located on or near any farmland and is not located within or near any areas zoned for agricultural use or areas having a Williamson Act contract. The project will not result in the conversion of any agricultural land to a nonagricultural use.

5.11.2.3 Jurisdictional Wetlands

The Stanton Storm Channel, a concrete-lined channel that bisects the SERC site, is a jurisdictional water of the United States. There are no wetlands mapped in the SERC area on the U.S. Fish and Wildlife National Wetlands Inventory (2016). The regulatory status of wetland issues, if applicable, and the waters of the United States are discussed in Section 5.2, Biological Resources. SERC construction will not involve work within the Stanton Storm Channel.

5.11.2.4 Soil Erosion during Construction

Construction impacts on soil resources can include increased soil erosion and soil compaction. Soil erosion causes the loss of topsoil and can increase the sediment load in surface receiving waters downstream of the construction site. The magnitude, extent, and duration of construction-related impacts depends on the erodibility of the soil, the proximity of the construction activity to the receiving water, and the construction methods, duration, and season.

Because conditions that could lead to excessive soil erosion via water are not present at the SERC site, little soil erosion from rain events is expected during the construction period. Additionally, best management practices (BMPs) will be implemented during construction in accordance with a site-specific stormwater pollution prevention plan (SWPPP) that is required under the Clean Water Act (CWA) for all construction projects over 1 acre in size. The California Energy Commission (CEC) also requires that project owners develop and implement a drainage, erosion, and sediment control plan (DESCP) to reduce the impact of runoff from construction sites. Monitoring will involve inspections to ensure that the BMPs described in the SWPPP/DESCP are properly implemented and effective. Therefore, impacts from soil erosion via water are expected to be less than significant.

The fine sandy loam texture of SERC site soils has the potential for moderate to high wind erosion potential; however, a substantial portion of the site is paved, and bare soil will not be exposed for long periods of time. Soil BMPs will be implemented throughout construction and grading. Wind erosion potential would be highest when dry, fine sandy material is left exposed. Compaction of site soils would be expected to reduce the overall potential for wind erosion in these soils, however. Soil stockpiles will be covered if they are not active prior to precipitation events, protected with a temporary sediment barrier during the rainy season, and located away from stormwater and drainage collection areas. Regular watering of exposed soils and establishment of short- and long-term erosion control measures will be used to further reduce soil loss attributable to erosion. For these reasons, impacts from soil erosion via wind are expected to be less than significant. Estimates of erosion by water and wind are provided in the following subsections.

5.11.2.4.1 Water Erosion

An estimate of soil loss during construction by water erosion is provided in Table 5.11-2. This estimate was developed using the Revised Universal Soil Loss Equation (RUSLE2) program incorporating the following assumptions (detailed calculations and assumptions for the soil loss estimates are provided in Appendix 5.11A):

- The SERC construction site totals 3.978 acres (1.764 acres at Parcel 1 and 2.214 acres at Parcel 2). It is assumed that soil grading at the site will occur over a 4-month and 6-month period for Parcels 1 and 2, respectively. It is assumed that Parcel 2 of the SERC site will be used as a laydown area only during construction on Parcel 1, which is estimated to take 6 months, and then Parcel 2 will be developed after removing existing paving. It is assumed that grading, excavation, and construction of the natural gas pipeline will take a total of 10 months, but only 10 percent of the total will be active at any time. It is assumed that 100 percent of the SERC site will have bare soil exposure during the construction period because of the removal of onsite asphalt.
- Estimates of soil loss (in tons) were made for the site-specific NRCS soil map units available within the RUSLE2 database.
- RUSLE2 rainfall erosivity conditions were estimated for the SERC site using the site-specific rainfall estimate for the 2-year, 6-hour storm from online National Weather Service data (National Oceanic and Atmospheric Administration [NOAA], 2016).
- A 100-foot slope length was assumed for all soil units. The median of each soil unit slope class was used for the RUSLE calculations.

Table 5.11-2. Estimate of Soil Loss by Water Erosion Using Revised Universal Soil Loss Equation

			Estimates Using Revised Universal Soil Loss Equation[a]		
Feature (acreage)[b]	**Activity**	**Duration (months)**	**Soil Loss (tons) without BMPs**	**Soil Loss (tons) with BMPs**	**Soil Loss (tons/yr) No Project[c]**
Parcel 1 Project Site (1.764 acres)	Grading	4	1.47	1.47	0.0004
	Construction	9	0.009	0.0003	---
Parcel 2 Project Site and Laydown Area (2.214 acres)	Grading	6	2.77	2.77	0.0002
	Construction	7	0.009	0.0003	---
Northern Pipeline Route (4-foot trench; 15-foot construction corridor)	Grading	10	0.24	0.24	0.0000
	Construction	10	0.003	0.0001	---
Southern Pipeline Route (4-foot trench; 15-foot construction corridor)	Grading	10	0.17	0.17	0.0000
	Construction	10	0.002	0.0001	---

Table 5.11-2. Estimate of Soil Loss by Water Erosion Using Revised Universal Soil Loss Equation

			Estimates Using Revised Universal Soil Loss Equation[a]		
Feature (acreage)[b]	**Activity**	**Duration (months)**	**Soil Loss (tons) without BMPs**	**Soil Loss (tons) with BMPs**	**Soil Loss (tons/yr) No Project[c]**
Gen-tie Line (4-foot trench; 15-foot construction corridor)	Grading	3	0.007	0.007	0.0000
	Construction	3	0.00008	0.000002	---
Project Soil Loss Estimates – Project with Northern Pipeline Route	**Construction Period**	**13**	**4.51**	**4.49**	**0.0005**
Project Soil Loss Estimates – Project with Southern Pipeline Route	**Construction Period**	**13**	**4.44**	**4.42**	**0.0005**

[a] Soil losses (tons/acre/year) are estimated using RUSLE2 software available online at http://fargo.nserl.purdue.edu/rusle2_dataweb/RUSLE2_Index.htm.

- The soil characteristics were estimated using RUSLE2 soil profiles corresponding to the mapped NRCS soil unit.
- Soil loss (R-factors) were estimated using 2-year, 6-hour point precipitation frequency amount for the SERC project site found at http://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html?bkmrk=ca.
- Estimates of actual soil losses use the RUSLE2 soil loss multiplied by the duration and the affected area. The No Project Alternative estimate does not have a specific duration so loss is given as tons/year.

[b] Pipeline acreages assume a 15-foot-wide corridor with a 4-foot-wide trench.

[c] Soil Loss estimate for No Project alternative for northern and southern pipeline route alternates, and the gen-tie line is considered to be zero because these areas are currently paved.

Soil losses are estimated using the following RUSLE2 conditions:

- **Construction** soil losses were approximated using BMPs: Bare ground; Contouring: None, rows up and down hill; Diversion/terracing: None; and Strips and Barriers: None.
- **Active grading** soil losses were approximated using BMPs: Bare ground, rough surface; Contouring: None, rows up and down hill; Diversion/terracing: None; and Strips and Barriers: None.
- **Construction** soil losses **with implementation of construction BMPs** was approximated using Management: Silt fence; Contouring: Perfect, no row grade; Diversion/terracing: None; and Strips and Barriers: two silt fences, one at end of RUSLE2 slope.
- A **No Project** soil loss estimate was also approximated using BMPs: Dense grass, not harvested; Contouring: None, rows up and down hill; Diversion/terracing: None; and Strips and Barriers: None.

With the implementation of appropriate BMPs that will be required under the National Pollutant Discharge Elimination System (NPDES) permit, and as described in Section 5.11.4.1, the total project soil loss of about 4.49 tons with the northern pipeline route, or 4.42 tons with the southern pipeline route, would not constitute a significant impact. Soil loss during construction of the linear features is not discussed separately because it has been grouped with the project as a whole. The soil loss during construction of the linear features represents a small portion of soil loss because there is no grading associated with the linears, and a smaller volume of soil will be disturbed during construction of the linear features.
Table 5.11-2 shows that soil losses by grading are much greater in magnitude than those associated with post-site clearance construction. Because there are no BMPs associated with grading, these soil loss estimates remain unchanged while the use of BMPs during construction results in consistent but smaller reductions in soil loss. It also should be recognized that the estimate of accelerated soil loss by water is very conservative (overestimate of soil loss). For example, the RUSLE2 calculation assumes only a single BMP (i.e., silt fencing), whereas the SWPPP will include multiple soil erosion and sediment control measures.

5.11.2.4.2 Wind Erosion

The potential for wind erosion of surface material was estimated by calculating the total suspended particulate (TSP) that could be emitted as a result of grading and the wind erosion of exposed soil. The total site area and grading duration were multiplied by emission factors to estimate the TSP matter emitted from the site. Fugitive dust from site grading was calculated using the default particulate matter less than 10 micrometers in aerodynamic diameter (PM10) emission factor used in URBEMIS2007 (Jones and Stokes Associates, 2007) and the ratio of fugitive TSP to PM10 published by the South Coast Air Quality Management District(SCAQMD) (1993). Fugitive dust resulting from the wind erosion of exposed soil was calculated using the emission factor in AP-42 (U.S. Environmental Protection Agency, 1995; Bay Area Air Quality Management District, 2005).

Table 5.11-3 summarizes the mitigated TSP predicted to be emitted from the SERC site from grading and the wind erosion of exposed soil. Without mitigation, the maximum predicted erosion of material from the SERC site is estimated at 1.286 tons for the northern pipeline alternative, or 1.222 tons for the southern pipeline alternative, over the course of the SERC construction cycle. This estimate is reduced to approximately 0.450 and 0.428 ton, respectively, for each pipeline alternative by implementing basic mitigation measures such as water application (see Section 5.11.4). These estimates are conservative because they make use of emission rates for a generalized soil rather than site-specific soil properties. With the implementation of mitigation measures described in Section 5.11.4.1, impacts related to soil erosion from wind will be less than significant.

Table 5.11-3. Soil Loss from Grading and Wind Erosion

Emission Source	Acreage	Duration (months)	Unmitigated TSP (tons)	Mitigated TSP (tons)
Grading Dust:				
Parcel 1 Project Site	1.764	4	0.121	0.042
Parcel 2 Project Site and Laydown Area	2.214	6	0.228	0.080
Northern Pipeline Alternative (trench)	0.134	10	0.023	0.008
Southern Pipeline Alternative (trench)	0.087	10	0.015	0.005
Gen-tie Line (trench)	0.043	3	0.002	0.001
Wind Blown Dust:				
Parcel 1 Project Site	1.764	13	0.503	0.176
Parcel 2 Project Site and Laydown Area	1.107	7	0.245	0.086
Northern Pipeline Route (corridor)	0.502	10	0.159	0.056
Southern Pipeline Route (corridor)	0.326	10	0.103	0.036
Gen-tie Line (corridor)	0.043	3	0.004	0.001
Estimated Total – Project with Northern Pipeline Route		**13**	**1.286**	**0.450**
Estimated Total – Project with Southern Pipeline Route		**13**	**1.222**	**0.428**

Note:

It is assumed that all linear feature impacts noted above are for portions outside of the project area's footprints. The rest of the assumptions for these calculations are provided in Appendix 5.11A.

5.11.2.5 Other Significant Soil Properties

The soil units underlying the SERC site are classified as having a low shrink-swell potential, so expansive soils will not be a concern at the project site. The materials encountered during the 2011 and 2016 geotechnical investigations borings did not note the presence of clay rich soils (Kling, 2011 and NV5, 2016).

Organic soils in fluvial environments can settle over a long period of time. Organic-rich soils were not identified at the SERC site or noted to be a concern (NV5, 2016).

No additional significant soil properties were identified in the SERC site-specific geotechnical investigation (NV5, 2016).

5.11.2.6 Compaction during Construction and Operation

Construction of the proposed project would result in soil compaction by use of heavy equipment during construction. Soil compaction increases soil density by reducing soil pore space. This also reduces the ability of the soil to absorb precipitation. Soil compaction can result in increased runoff, erosion, and sedimentation. The incorporation of BMPs in accordance with the SWPPP/DESCP guidelines during construction will result in less-than-significant impacts from soil compaction.

Because SERC will be constructed in a previously developed industrial area that will be repaved or otherwise protected during and after construction, the overall anticipated effects of compaction during construction are considered to be less than significant.

Operation of the SERC will not result in impacts on the soil from erosion or compaction. Routine vehicle traffic during plant operation will be limited to existing roads, all of which are paved or covered with gravel, and standard operational activities will not involve the disruption of soil. Therefore, impacts on soil from project operations will be less than significant.

5.11.2.7 Effects of Emissions on Soil-Vegetation Systems

Emissions from a generating facility could have an adverse effect on soil-vegetation systems. This is principally a concern where environments that are highly sensitive to nutrients or salts are downwind of the project. There are no habitats in or surrounding the project area that are known to be especially sensitive to the effects of nitrogen deposition. The project will operate as a peaking facility and will be in operation only a low percentage of the time. For these reasons, the addition of small amounts of nitrogen to the area will result in a less-than-significant impact to soil-vegetation systems. Additional discussion regarding nitrogen deposition and impacts to biological resources in the area can be found in Section 5.2, Biological Resources.

5.11.3 Cumulative Effects

A cumulative impact refers to a proposed project's incremental effect together with other closely related past, present, and reasonably foreseeable future projects whose impacts may compound or increase the incremental effect of the proposed project (Public Resources Code §21083; Title 14, California Code of Regulations, §15064[h], 15065[c], 15130, and 15355).

Numerous development projects are being planned within or near the City of Stanton (see Appendix 5.6A). Approved projects to be constructed or under construction in proximity to the SERC site include the following:

- Construction of a commercial development including a retail pad building, drive-through restaurant, gas station, and drive-through car wash at 11382, 11430, and 11462 Beach Boulevard
- Construction of five-story mixed use development including outpatient clinic, assisted living facility, and restaurant at 12282 Beach Boulevard

- A request for Conditional Use Permit approval to operate an approximately 21,567 square-foot grocery store with an original ABC Type "20" (Off-Sale, Beer and Wine) License at 9901 Chapman Avenue, Garden Grove, California

The project's expected minor to negligible effects on soil erosion, sedimentation, and compaction are not considered to be significant, particularly with the application of onsite construction BMPs. Given the requirements of the permitting and construction compliance processes that the SERC and other approved projects must go through, it is very unlikely that these or other projects would have adverse impacts on soil resources that, combined with those of SERC, would reach the level of significance.

As previously described, the SERC will have no effect on agriculture because there are no permanent agricultural uses at the site or nearby. The SERC site and surrounding area are developed intensively for urban and industrial uses.

5.11.4 Mitigation Measures

BMPs in accordance with the SWPPP and DESCP will be used to minimize erosion at the site during construction. These erosion-control measures will be required to help maintain water quality, protect property from erosion damage, and prevent accelerated soil erosion or dust generation that destroys soil productivity and soil capacity. Typically, these measures include mulching, physical stabilization, dust suppression, berms, ditches, and sediment barriers. Water erosion and sedimentation will be mitigated through the use of surface protections and sediment barriers. Wind erosion potential will be reduced significantly by keeping soil moist or by covering and/or hydroseeding soil stockpiles. Upon completion of construction activities, land surfaces will be permanently stabilized. The SERC site will be paved or completely covered with structures or pervious ground cover (e.g., gravel or landscape). Therefore, soil erosion losses after construction are expected to be less than significant.

5.11.4.1 Temporary Erosion Control Measures

BMPs will be implemented during construction in accordance with the SWPPP required by the State's General Construction Permit for all construction projects over 1 acre in size that discharge to the nation's waters. Additionally, the CEC requires that project owners develop and implement a DESCP to reduce the impact of runoff from construction sites. In some cases, the DESCP may be combined with the SWPPP.

Temporary erosion control measures required for the SWPPP and DESCP will be implemented before construction begins, and will be evaluated and maintained during construction. These measures typically include, but are not limited to, revegetation, mulching, physical stabilization, dust suppression, berms, ditches, and sediment barriers. Temporary measures will be removed from the SERC site after the completion of construction.

During construction of the SERC, dust erosion control measures will be implemented to minimize the wind-blown loss of soil from the SERC site. Water of a quality equal to or better than existing surface runoff will be sprayed on the soil in construction areas to control dust prior to completion of permanent control measures.

Sediment barriers, which slow runoff and trap sediment, will be incorporated as discussed below. Sediment barriers include straw bales, sand bags, straw wattles, and silt fences. These features are generally placed below disturbed areas, at the base of exposed slopes, and along streets and property lines below the disturbed area. Sediment barriers are often placed around sensitive areas to prevent contamination by sediment-laden water near areas such as wetlands, creeks, or storm drains.

The SERC will be constructed on relatively level ground; therefore, it is not considered necessary to place sediment barriers around the entire property boundary. However, barriers may be placed in locations where offsite drainage could occur to prevent sediment from leaving the SERC site. If used, sediment barriers will be properly installed (e.g., staked and keyed into the ground surface), then removed or used as mulch after construction. Runoff detention basins, drainage diversions, and other large-scale sediment traps are not considered necessary because of the SERC site's small size, level topography, and surrounding paved areas. Sediment barriers will be installed around the base of the soil stockpiles, and stockpiles will be stabilized and covered.

Mitigation measures, such as watering exposed soil surfaces, are used to reduce PM10 emissions during construction activities. The PM10 reduction efficiencies are taken from the SCAQMD CEQA Handbook (1993) and were used to estimate the effectiveness of the mitigation measures. Table 5.11-4 summarizes the mitigation measures and PM10 reduction efficiencies.

Table 5.11-4. Mitigation Measures for Fugitive Dust Emissions

Mitigation Measure	PM10 Emission Reduction Efficiency (percent)
Water active sites at least twice daily	34–68
Enclose, cover, water twice daily, or apply nontoxic soil binders, according to manufacturer's specifications, to exposed piles (gravel, sand, dirt) with 5 percent or greater silt content	30–74

Source: SCAQMD, 1993

5.11.4.2 Permanent Erosion Control Measures

Permanent erosion control measures on the SERC site may include graveling, paving, landscaping, and drainage systems, as appropriate.

5.11.5 Laws, Ordinances, Regulations, and Standards

Federal, state, county, and local LORS applicable to soils are discussed below and summarized in Table 5.11-5.

Table 5.11-5. Laws, Ordinances, Regulations, and Standards for Soils

LORS	Requirements/Applicability	Administering Agency	Application for Certification Section Explaining Conformance
Federal			
1972 Amendments to Federal Water Pollution Control (CWA, including 1987 amendments)	Regulates stormwater and non-storm water discharges from construction and industrial activities	RWQCB – Santa Ana Region (8) and SWRCB. U.S. Environmental Protection Agency has oversight authority.	Section 5.11.5.1
NRCS (1983), *National Engineering Handbook*, Sections 2 and 3	Standards for soil conservation	NRCS	Section 5.11.5.1
State			
Porter-Cologne Water Quality Control Act	Regulates discharges of waste to state waters and to land	RWQCB – Santa Ana Region (8) and SWRCB	Section 5.11.5.2
Santa Ana Region Basin Plan	Regulates water quality and discharge of waste to Santa Ana waters and to land	RWQCB – Santa Ana Region (8)	Section 5.11.5.2
Table 18-1-B of the Uniform Building Code (International Code Council, 1997)	Sets standards for defining expansive and liquefiable soils	CEC	Section 5.11.5.2

Table 5.11-5. Laws, Ordinances, Regulations, and Standards for Soils

LORS	Requirements/Applicability	Administering Agency	Application for Certification Section Explaining Conformance
Local			
City of Stanton General Plan and Zoning Ordinance	Requirements for Site Plan Reviews and Environmental Assessments including requirements for building on native soils and soil conservation	City of Stanton, Community Development, Planning Division	Section 5.11.5.3
City of Stanton Municipal Code	Standards for grading and water quality, including permit requirements	City of Stanton, Community Development, Building Division	Section 5.11.5.3

Note:

RWQCB = Regional Water Quality Control Board

5.11.5.1 Federal LORS

5.11.5.1.1 Federal Clean Water Act

The CWA establishes requirements for discharges of stormwater or wastewater from any point source that would affect the beneficial uses of waters of the United States. Section 402 of the CWA effectively prohibits discharges of stormwater from construction sites unless the discharge is in compliance with an NPDES permit. SWRCB is the permitting authority in California and has adopted a statewide general permit for stormwater discharges associated with construction activity (SWRCB, 2012) that applies to projects resulting in 1 or more acres of soil disturbance. SERC would result in disturbance of more than 1 acre of soil. Therefore, the project would need to be covered under the General Construction Permit (SWRCB, 2012) and develop and implement a site-specific SWPPP to meet permit requirements. Requirements are described in greater detail in Section 5.15, Water Resources.

5.11.5.1.2 U.S. Department of Agriculture Engineering Standards

Sections 2 and 3 of the U.S. Department of Agriculture NRCS National Engineering Handbook (NRCS, 1983) provide standards for soil conservation during planning, design, and construction activities.

5.11.5.2 State LORS

5.11.5.2.1 California Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (California Water Code, Division 7) is the State law governing water quality of all state waters, including both surface waters and groundwater. Under the Porter-Cologne Water Quality Control Act, SWRCB has the ultimate authority over water quality policy on a state-wide level, and nine RWQCBs establish and implement water quality standards specific for each respective region. The Santa Ana RWQCB regulates water quality in the SERC area, and the project would need to meet water quality standards that are identified in the Water Quality Control Plan for this region.

5.11.5.2.2 Santa Ana Region Basin Plan

The Basin Plan (Water Quality Control Plan) for the Santa Ana Region establishes water quality standards for the ground and surface waters of the region. The Basin Plan includes an implementation plan describing the actions by RWQCB and others that are necessary to achieve and maintain the water quality standards. The Santa Ana RWQCB regulates waste discharges to minimize and control effects of the quality of the region’s water, and it is the permitting agency for discharge.

5.11.5.2.3 Uniform Building Code

Table 18-1-B of the Uniform Building Code (International Code Council, 1997) defines the criteria for expansive soils.

5.11.5.3 Local LORS

The City of Stanton General Plan includes requirements for building on native soils and soil conservation, as required by State law. The General Plan, Section CHS-1.1.1 (b) requires a review of the soils and geologic conditions to determine liquefaction susceptibility of a proposed project site (RBF, 2008).

The City of Stanton Municipal Code requires that plans meet standards for grading and water quality. Municipal Code Section 20.500.090 requires construction of new nonresidential development projects to obtain a building or grading permit. Chapter 16.55 explains grading permit requirements. The zoning code Section 20.530.020 also requires new development to prepare a water quality management plan, designed to control pollutants in stormwater and urban runoff in order to prevent any deterioration of water quality that would impair subsequent to completing uses of the receiving waters (City of Stanton, 2013). The Municipal Code Chapter 16.62 provides additional details on erosion control and water quality (City of Stanton, 2016).

5.11.6 Agencies and Agency Contacts

Applicable permits and agency contacts for soils are shown in Table 5.11-6.

Table 5.11-6. Permits and Agency Contacts for Soils

Permit or Approval	Agency Contact	Applicability
Stanton Grading and Building Permit	Renee Meriaux Building Official, Community Development City of Stanton 7800 Katella Avenue Stanton, CA 90680 (714) 890-4202	Building and grading permits
WQMP	Cynthia Burgos Community Development/Planning Division/Planner City of Stanton 7800 Katella Avenue Stanton, CA 90680 (714) 890-4234	WQMP

Note:

WQMP = Water Quality Management Plan

5.11.7 Permits and Permit Schedule

It is expected that all the required ministerial permits for grading, building, and WQMP can be secured as long as completed applications are provided to the appropriate agency prior to construction.
The WQMP will need to be provided to the planning department anywhere from 2 to 8 months prior to construction, as part of the planning application. The grading and building permits would be started after receiving approval from the planning department for the project. Other permits that relate to soils, such as the NPDES permit, are evaluated in other sections (see Section 5.15, Water Resources).

5.11.8 References

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